

February 3, 2015 ^{4th}

Starter

$$3c + 4 - 8c$$

$$-5c + 4$$

Simplify each completely.

1. $\frac{2x - 7 + 5x}{7x - 7}$

2. $\frac{-n + 8 - n - 5}{-2n + 3}$

3. $\frac{4c - c + 12 - 9}{3c + 3}$

4. $\frac{-3v - 10 + 15 + 7v}{4v + 5}$

1 = variable first

2/3 - Converting between Units

First you need to understand UNIT FRACTIONS.

Definition: a *unit fraction* is a fraction where the numerator and the denominator are the same size but may be different units.

Examples: $\frac{1 \text{ ft}}{12 \text{ in}}$ $\frac{1 \text{ yd}}{3 \text{ ft}}$ $\frac{60 \text{ min}}{1 \text{ hr}}$

Convert 13 feet to inches using unit fractions.

$$\begin{aligned}13 \text{ feet} &= \frac{13 \text{ ft}}{1} \\&= \frac{13 \text{ ft}}{1} \cdot 1 \\&= \frac{13 \text{ ft}}{1} \cdot (\text{any unit fraction}) \\&= \frac{13 \text{ ft}}{1} \cdot \frac{\text{any number}}{\text{itself}} \\&= \frac{13 \text{ ft}}{1} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \\&= \frac{156 \text{ in}}{1} \\&= 156 \text{ in}\end{aligned}$$

Convert one unit to the other by using unit fractions.

leave the label on the top!

$$2\frac{1}{2} \text{ ft} = \underline{\hspace{2cm}} \text{ in}$$
$$\frac{5 \cancel{\text{ft}}}{2} \cdot \frac{12 \text{ in}}{1 \cancel{\text{ft}}}$$
$$= \frac{60}{2} \text{ in}$$
$$= 30 \text{ in}$$
$$12 \text{ in} = 1 \text{ ft}$$

$$7\frac{3}{4} \text{ in} = \underline{\hspace{2cm}} \text{ ft}$$
$$\frac{31 \text{ in}}{4} \cdot \frac{1 \text{ ft}}{12 \text{ in}}$$
$$= \frac{31}{48} \text{ ft}$$
$$12 \text{ in} = 1 \text{ ft}$$

$$1\frac{1}{4} \text{ hours} = \underline{\hspace{2cm}} \text{ min}$$
$$\frac{5 \cancel{\text{hr}}}{4} \cdot \frac{60 \text{ min}}{1 \cancel{\text{hr}}}$$
$$= 75 \text{ min}$$
$$60 \text{ min} = 1 \text{ hr}$$

$$1\frac{1}{2} \text{ pints} = \underline{\hspace{2cm}} \text{ quarts}$$
$$\frac{3 \cancel{\text{pts}}}{2} \cdot \frac{1 \text{ qt}}{2 \cancel{\text{pts}}}$$
$$= \frac{3}{4} \text{ qts}$$
$$1 \text{ qt} = 2 \text{ pts}$$

Convert 60 miles per hour to miles per minute using unit fractions.

$$60 \text{ mph} = \frac{60 \text{ miles}}{1 \text{ hour}}$$

Convert each unit rate using unit fractions.

$$20 \text{ mph} = \underline{\hspace{2cm}} \text{ ft/hr}$$

$$\frac{20 \text{ mi}}{\text{hr}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} = ? \frac{\text{ft}}{\text{hr}}$$

$$= 105,600 \text{ ft/hr}$$

$$1 \text{ mi} = 5280 \text{ ft}$$

$$20 \text{ mph} = \underline{\hspace{2cm}} \text{ miles/minute}$$

$$\frac{20 \text{ mi}}{\text{hr}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} = ? \frac{\text{mi}}{\text{min}}$$

$$= \frac{20 \text{ mi}}{60 \text{ min}} = \frac{1}{3} \text{ mi/min}$$

$$60 \text{ min} = 1 \text{ hr}$$

$$20 \text{ gal/min} = \underline{\hspace{2cm}} \text{ gal/hr}$$

$$\frac{20 \text{ gal}}{\text{min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}}$$

$$= 1200 \text{ gal/hr}$$

$$1 \text{ hr} = 60 \text{ min}$$

$$15 \text{ miles/gal} = \underline{\hspace{2cm}} \text{ miles/quart}$$

$$\frac{15 \text{ mi}}{\text{gal}} \cdot \frac{1 \text{ gal}}{4 \text{ qts}}$$

$$= \frac{15}{4} \text{ mi/qt}$$

$$= 3 \frac{3}{4} \text{ mi/qt}$$

$$\begin{array}{r} 3 \\ 4 \overline{) 15} \\ \underline{12} \\ 3 \end{array} \quad 1 \text{ gal} = 4 \text{ qt}$$

Homework

Green WS 6

Due Monday